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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,992	01/20/2004	Elliott J. Straus	OMNZ 2 00014	1988

7590 03/17/2008

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EXAMINER	
LUU, CUONG V	

ART UNIT	PAPER NUMBER
2128	

MAIL DATE	DELIVERY MODE
03/17/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/760,992	STRAUS, ELLIOTT J.	
	Examiner	Art Unit	
	CUONG V. LUU	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 February 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The Examiner would like to thank the Applicant for the well-presented response, which was useful in the examination. The Examiner appreciates the effort to perform a careful analysis and make appropriate amendments to the claims.

Claims 11-29 are pending. Claims 11-29 have been examined. Claims 11-29 have been rejected.

Response to Arguments

1. Applicant's arguments, see pp. 6-7, filed 2/5/2008, with respect to the U.S.C. 112, 2nd paragraph rejections of claims 12 and 22 have been fully considered and are persuasive. The U.S.C. 112, 2nd paragraph rejections of claims 12 and 22 have been withdrawn.

2. Applicant's arguments, see p. 7, filed 2/5/2008, with respect to the U.S.C. 112, 1st paragraph rejections of claims 15-16 and 25-26 have been fully considered and are persuasive. The U.S.C. 112, 1st paragraph rejections of claims 15-16 and 25-26 have been withdrawn.

3. Applicant's arguments filed 2/5/2008 regarding claims 20 and claim 27-29 that depend therefrom, see pages 7-8, have been fully considered but they are not persuasive. The Applicant argues that Chen does not disclose optimizing the location of in-mold injection port to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article. The Examiner respectfully disagrees. Chen does disclose this limitation on page 3 col. 2 section Filling Pattern. In this section, Chen says "*By observing equation 7,*

one can deduct that the dominant term in the IMC gap is the substrate thickness. Thus an approximate way of predicting the fill patterns would be to assume injection in to a gap equal to the difference between uncompressed and compressed substrate thickness." This teaching clearly shows that Chen uses the predicted fill patterns to determine the optimal location of in-mold injection port to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article. In addition, the Applicant argues that "*according to the Examiner, fluidity S is a ratio between flow rate and gradient pressure, and equation 11 of Chen establishes a relationship between flow rate and pressure gradient. Therefore, equation 11 is essentially equating S, not determining a relationship between S and the gradient pressure*". By definition in American Heritage College dictionary, 4th Edition, relationship is the condition of being related, connection or association. In equation 11, Chen shows fluidity S to be equal to the ratio between flow rate and gradient pressure, which means fluidity S is associated with pressure gradient via a defined equation. Therefore, Chen does determine the relationship between fluidity S and a pressure gradient. Claim 20 and 27-29 that depend therefrom, therefore, remain rejected.

4. Applicant's arguments filed 2/5/2008 regarding claim 11 have been fully considered but they are not persuasive. The Applicant argues that Chen does not teach a method for optimizing the location of an in-mold coating injection point in a mold so as to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article. This argument has been addressed in item 3. In addition, the Applicant argues that neither Ladeine nor Chen discloses repeating the steps a), b), and c) until the in mold coating composition is complete. The Examiner respectfully disagrees. Ladeine does teach the step of repeating a), b), and c). On page 515 paragraph 1,Ladeinde teaches using1 a finite

difference method. The method finite difference described in this paper by Ladeinde inherits steps a), b), and c) since it involves dividing a part into a number of finite elements and performing numerical analysis starting at a fixed location and traverse in a direction in term of distance and time. Also, the method perform numerical analysis starting at a fixed location and traverse in a direction in term of distance and time. The teachings of using finite elements method and starting at a fixed location and traverse in a direction in term of distance and time indicates that steps a), b), and c) are repeated in increment of fixed distance and time until all the part is done with the process of molding. Claim 11, therefore, remain rejected.

5. Claims 12-14 and 17-19 are argued allowable due to depending on allowable claim 11. Since claim 11 remains rejected, claims 12-14 and 17-19 remain rejected.

6. Claims 15-16 are argued allowable due to depending on allowable claim 11. Since claim 11 remains rejected, claims 15-16 remain rejected.

7. Applicant's arguments filed 2/5/2008 regarding claim 21, see pages 10-11 have been fully considered but they are not persuasive. The Applicant argues that Ladeine discourages hybrid method with finite element in the lateral plane and a finite difference in the traverse direction; therefore, it would not be obvious to one skilled in the art to use the finite elements method combined with a control volume approach. The Examiner respectfully disagrees. Ladeine discourages hybrid method with finite element in the lateral plane and a finite difference in the traverse direction but does not specifically discourages the finite elements

method combined with a control volume approach. In fact, Ladeine teaches this combination. Ladeine uses the finite elements method (p. 515 paragraph 1) and control volume approach together in this paper (page 515 section Code validation and application 1st paragraph of the section last 6 lines of the paragraph). Claim 21, therefore, remains rejected.

8. Claims 22-24 and 25-26 are argued allowable due to depending on allowable claim 20. Since claim 20 remains rejected, claims 22-24 and 25-26 remain rejected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 20 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al (In-Mold Functional Coating of Thermoplastic Substrate: Process Modeling, Antec 2001, 255. Since pages are not numbered, for the purpose of examining, the examiner numbers them from 1 for the first page to 5 for the last page and columns 1 and 2 for each page).

1. As per claim 20, Chen teaches a method for optimizing the location of an in-mold coating injection port in a mold so as to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article, said method comprising the steps of:

   predicting a coating composition fill pattern in said mold over at least a two dimensional surface (p. 2 col. 1 lines 1-3)); and

   using said pattern to determine optimal placement of a coating injection nozzle so as to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article and to reduce the presence of surface defect of a coating formed from said in-mold coating composition (p. 1 col .2 the last 2 lines, p. 2 col. 1 lines 1-3, and page 3 col. 2 section Filling Pattern); and

   placing said injection nozzle in said optimal placement position, wherein said step of predicting a coating fill pattern in said mold is performed by determining the following a) the relationship between a fluidity, S, of an in mold coating composition and a pressure gradient present in said mold (p. 2 col. 2 the last 2 lines and p. 3 col. 1 lines 1-2 and equation 11. fluidity S is a ratio between flow rate and gradient pressure; equation 11 establish a relationship between flow rate and gradient pressure, so it implicitly determines the relationship between a fluidity, S, of an in mold coating composition and a pressure gradient present in said mold), and b) the relationship between the coating thickness of the in mold coating composition and an injection pressure (p. 3 col. 1 lines 1-2 and equation 11. Equation 11 reads onto this limitation).

2. As per claim 27, Chen teaches said process minimizes the potential for surface defects in an in mold coating formed on a surface of said molded article (p. 1 col. 2 lines 1-5).

3. As per claim 28, Chen teaches said method is used for an in-mold coating process including at least filling, packing, and solidification phases (p. 2 col. 2 paragraph 2).

4. As per claim 29, Chen teaches said method is used in conjunction with a method to minimize a cure time of the in-mold coating composition (p. 2 col. 1 lines 1-3).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11-14 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al (In-Mold Functional Coating of Thermoplastic Substrate: Process Modeling, Antec 2001, 255) in view of Ladeinde (A Procedure for Advection and Diffusion in Thin Cavities, Computational Mechanics 15 (1995) pp. 511-520, Springer-Verlag, 1995).

5. As per claim 11, As per claim 11, Chen teaches a method for optimizing the location of an in-mold coating injection port in a mold so as to minimize the flow time for an in-mold coating composition to flow over at least a part of a molded article, said method comprising the steps of:

predicting a coating composition fill pattern in said mold (p. 2 col. 1 lines 1-3); and

using said pattern to determine optimal placement of a coating injection nozzle so as to minimize the flow time for an in-mold coating composition to flow over at least a part of a

molded article and to reduce the presence of surface defects of a coating formed from said in-mold coating composition (p. 2 col. 1 lines 1-3 and page 3 col. 2 section Filling Pattern. The step of predicting fill pattern above results in determining optimal placement of a coating injection nozzle so as to minimize the flow time for an in-mold coating composition, and p. 2 col. 1 lines 1-3 also teaches IMC reduce the presence of surface defects of a coating formed from said in-mold coating composition); and

placing said injection nozzle in said optimal placement position, wherein said step of predicting a coating composition fill pattern in said mold is performed by determining the relation between a pressure in said mold and a flow rate of said coating composition (p. 2 col. 2 the last 2 lines of the col. and p. 3 col. 1 lines 1-2 and equation 11) using numerical method and d) repeating filling until the in mold coating composition filling process is complete (p. 2 col. 2 paragraph 2).

However, Chen does not teach using the numerical method being a finite difference method comprising the steps of:

a) defining a fixed spatial step to track a flow front location of the in mold coating composition,

b) advancing the flow front location by one spatial step for a fixed time increment,

c) obtaining the pressure and coating composition thickness distributions for said in mold coating, and

d) repeating said steps until the in mold coating composition filling process is complete.

Ladeinde teaches using a finite difference method comprising the steps of (p. 515 paragraph 1. The method finite difference described in this paper by Ladeinde inherits steps a), b), c) and d) since it involves dividing a part into a number of finite elements and

performing numerical analysis starting at a fixed location and traverse in a direction in term of distance and time:

a) defining a fixed spatial step to track a flow front location of the in mold coating composition,

b) advancing the flow front location by one spatial step for a fixed time increment,

c) obtaining the pressure and coating composition thickness distributions for said in mold coating, and

d) repeating said steps until the in mold coating composition is complete.

It would have been obvious to one of ordinary skill in the art to combine the teachings of Chen and Ladeinde. Ladeinde's teachings would have controlled non-linear instability (p. 515 paragraph 1).

6. As per claim 12, Ladeinde teaches instructions for carrying out said method are contained in a computer readable medium (p. 519 paragraph 1 of section 4 Computational speed).

7. As per claim 13, Ladeinde teaches said steps of predicting a fill pattern and determining optimal placement of said nozzle are performed by a computer (p. 519 paragraph 1 of section 4 Computational speed).

8. As per claim 14, it is a choice for one of ordinary skill in the art to input data necessary for performing said steps into said computer manually. This limitation is, therefore, rejected.

9. As per claim 17, Chen teaches said process minimizes the potential for surface defects in an in mold coating formed on a surface of said molded article (p. 1 col. 2 lines 1-5).

10. As per claim 18, Chen teaches said method is used for an in-mold coating process including at least filling, packing, and solidification phases (p. 2 col. 2 paragraph 2).

11. As per claim 19, Chen teaches said method is used in conjunction with a method to minimize a cure time of the in-mold coating composition (p. 2 col. 1 lines 1-3).

Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Ladeinde as applied to claims 13 above, and further in view of Walsh (US Patent 6,099,162).

12. As per claim 15, Chen and Ladeinde do not teach data necessary for performing said steps is automatically provided to said computer by an instrument taking differential scanning calorimetry measurements.

    However, Wash teaches this limitation (col. 1 lines 43-53 and col. 3 lines 27-36. The sensors can be considered differential scanning calorimeters to obtain measurements as recited in col. 1 lines 43-53).

    It would have been obvious to one of ordinary skill in the art to combine the teachings of Chen, Ladeinde, and Walsh. Wash's teachings would have accurately and continuously monitored the monitoring the curing process (col. 3 lines 24-27).

13. As per claim 16, Chen teaches said data is stored in a data collection means associated with said instrument (p. 2 col. 1 paragraphs 1-3 of section Material characterization. These paragraphs teach using data measured by DSC to perform calculation. This suggests this limitation) and Ladeinde teaches using computer with data input to perform analysis (p. 519 paragraph 1 of section 4 Computational speed).

Claims 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen as applied to claim 20 and further in view of Ladeinde.

14. As per claim 21, Chen does not teach using a finite element method combined with a control volume approach can be used to numerically determine said relationships. However, Ladeinde teaches this limitation (p. 515 paragraph 1 and page 515 section Code validation and application 1st paragraph of the section last 6 lines of the paragraph).

It would have been obvious to one of ordinary skill in the art to combine the teachings of Chen and Ladeinde. Ladeinde's teachings would have controlled non-linear instability (p. 515 paragraph 1).

Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen as applied to claim 20 and further in view of Zuyev (Optimizing Injection Gate Location and Cycle Time for the In-Mold Coating (IMC) Process, Antec 2001).

15. As per claim 22, Chen does not teach instruction for carrying out said method are contained in a computer readable medium.

However, Zuyev teaches this limitation (p. 195 col. 2 of the page section Optimal Location of IMC Injection Point paragraph 1 of the section).

It would have been obvious to one of ordinary skill in the art to combine the teachings of Chen and Zuyev. Zuyev's teachings would have made a good prediction of the fill pattern (p. 195 col. 2 of the page section Optimal Location of IMC Injection Point paragraph 1 of the section).

16. As per claim 23, the discussions in claim 22 imply this limitation. It is, therefore, rejected for the same reasons.

17. As per claim 24, it is a choice for one of ordinary skill in the art to input data necessary for performing said steps into said computer manually. This limitation is, therefore, rejected.

Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of Zuyev as applied to claim 23 above, and further in view of Walsh (US Patent 6,099,162).

18. As per claim 25, Chen does not teach data necessary for performing said steps is automatically provided to said computer by an instrument taking differential scanning calorimetry measurements.

    However, Wash teaches this limitation (col. 1 lines 43-53 and col. 3 lines 27-36. The sensors can be considered differential scanning calorimeters to obtain measurements as recited in col. 1 lines 43-53).

It would have been obvious to one of ordinary skill in the art to combine the teachings of Chen and Walsh. Wash's teachings would have accurately and continuously monitored the monitoring the curing process (col. 3 lines 24-27).

19. As per claim 26, Chen teaches said data is stored in a data collection means associated with said instrument (p. 2 col. 1 paragraphs 1-3 of section Material characterization. These paragraphs teach using data measured by DSC to perform calculation. This suggests this limitation) and Zuyev suggests using computer with data input to perform analysis (p. 195 col. 2 of the page section Optimal Location of IMC Injection Point paragraph 1 of the section).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cuong V. Luu whose telephone number is 571-272-8572. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah, can be reached on 571-272-2279. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. An inquiry of a general nature or relating to the status of this application should be directed to the TC2100 Group receptionist: 571-272-2100.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Cuong V Luu/

Examiner, Art Unit 2128

/Kamini S Shah/

Supervisory Patent Examiner, Art Unit 2128